Sustainable Production of Natural Dyes for Textile Product via SUBMEX

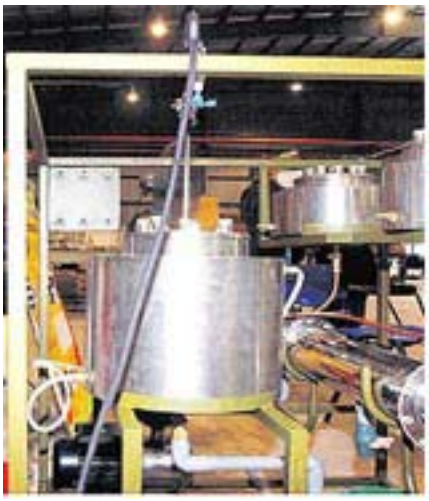
A novel submerged membrane extractor (SUBMEX) system is developed in order to extract the natural colourants from 'green' resources (*pitaya* fruit waste, *senduduk and turmeric*). The membrane is assembled in a modular form with appropriate membrane surface area.

Before designing the SUBMEX system, the identification of the feed solution characteristics is crucial in order to best design the right membrane for the extraction and separation processes.

The SUBMEX practice has shown tremendous economic results by reducing waste generation, involving safe and eco-friendly processes, as well as saving energy and labour costs. In addition the system is compact, easy to operate, portable, produces a small footprint and has the potential to be upgraded or commercialised.

The natural colour produced from SUBMEX does not have any harmful organic solvent content. The application of these natural dyes for textile products does not only represent an interesting possibility to use renewable primary products, but also contributes to the protection of non-renewable resources and the preservation of agricultural areas.

Natural Dyes produced from SUBMEX



Submerged Membrane Reactors (SUBMEX)

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The Raw Materials Used to Produce Natural Dyes